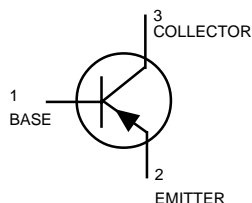


# High Voltage Transistor

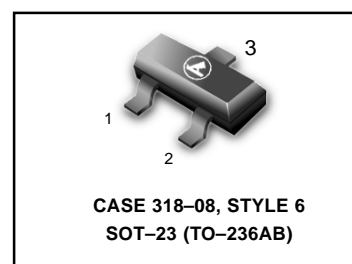
PNP Silicon



**MMBTA92LT1**  
**MMBTA93LT1**

## MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		MMBTA92	MMBTA93	
Collector–Emitter Voltage	$V_{CE0}$	-300	-200	Vdc
Collector–Base Voltage	$V_{CBO}$	-300	-200	Vdc
Emitter–Base Voltage	$V_{EBO}$	-5.0		Vdc
Collector Current — Continuous	$I_C$	-500		mAdc



## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (1) $T_A = 25^\circ\text{C}$	$P_D$	225	mW
Derate above $25^\circ\text{C}$		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	$P_D$	300	mW
Derate above $25^\circ\text{C}$		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

## DEVICE MARKING

MMBTA92LT1 = 2D, MMBTA93LT1 = 2E

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
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## OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage(3) ( $I_C = -1.0 \text{ mAdc}, I_B = 0$ )	MMBTA92 MMBTA93	$V_{(BR)CEO}$	-300 -200	— —	Vdc
Collector–Emitter Breakdown Voltage ( $I_C = -100 \mu\text{Adc}, I_E = 0$ )	MMBTA92 MMBTA93	$V_{(BR)CBO}$	-300 -200	— —	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -100 \mu\text{Adc}, I_C = 0$ )		$V_{(BR)EBO}$	-5.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = -200\text{Vdc}, I_E = 0$ ) ( $V_{CB} = -160\text{Vdc}, I_E = 0$ )	MMBTA92 MMBTA93	$I_{CBO}$	— —	-0.25 -0.25	nAdc
Collector Cutoff Current ( $V_{CB} = -3.0\text{Vdc}, I_C = 0$ )		$I_{EBO}$	—	-0.1	$\mu\text{Adc}$

1. FR-5 =  $1.0 \times 0.75 \times 0.062$  in.

2. Alumina =  $0.4 \times 0.3 \times 0.024$  in. 99.5% alumina.

3. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

**MMBTA92LT1 MMBTA93LT1**

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
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**ON CHARACTERISTICS (3)**

DC Current Gain ( $I_C = -1.0\text{mA}$ , $V_{CE} = -10\text{Vdc}$ )	Both Types	25	—	—
( $I_C = -10\text{mA}$ , $V_{CE} = -10\text{Vdc}$ )	Both Types	40	—	—
( $I_C = -30\text{mA}$ , $V_{CE} = -10\text{Vdc}$ )	MMBTA92	25	—	—
	MMBTA93	25	—	—
Collector–Emitter Saturation Voltage ( $I_C = -20\text{mA}$ , $I_B = -2.0\text{mA}$ )	MMBTA92	—	-0.5	Vdc
	MMBTA93	—	-0.5	Vdc
Base–Emitter Saturation Voltage ( $I_C = -20\text{mA}$ , $I_B = -2.0\text{mA}$ )		—	-0.9	Vdc

**SMALL–SIGNAL CHARACTERISTICS**

Current–Gain — Bandwidth Product(3),(4) ( $I_C = -10\text{mA}$ , $V_{CE} = -20\text{Vdc}$ , $f = 100\text{MHz}$ )		$f_T$	50	—	MHz
Collector – Base Capacitance ( $V_{CB} = -20\text{Vdc}$ , $I_E = 0$ , $f = 1.0\text{MHz}$ )	MMBTA92		—	6.0	pF
	MMBTA93		—	8.0	pF

3. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

MMBTA92LT1 MMBTA93LT1

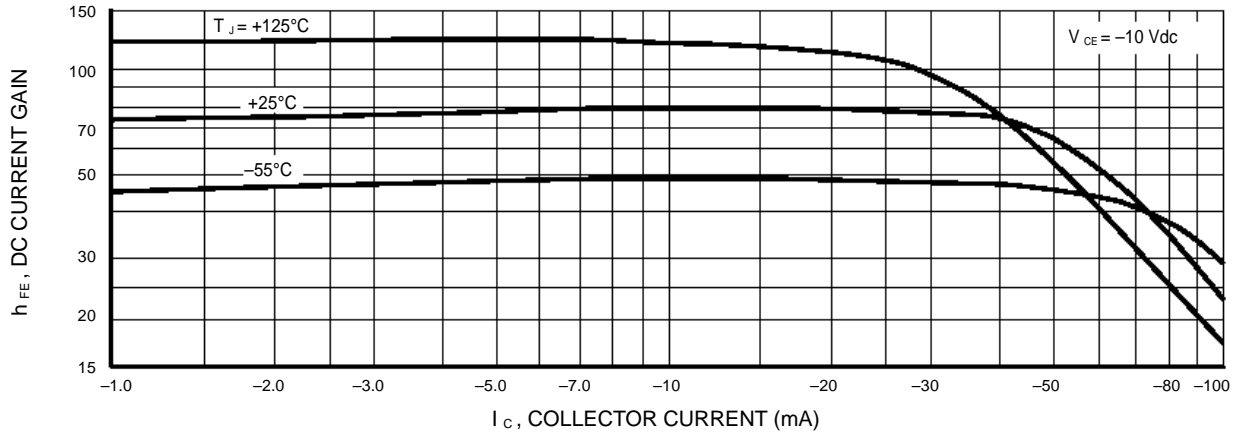


Figure 1. DC Current Gain

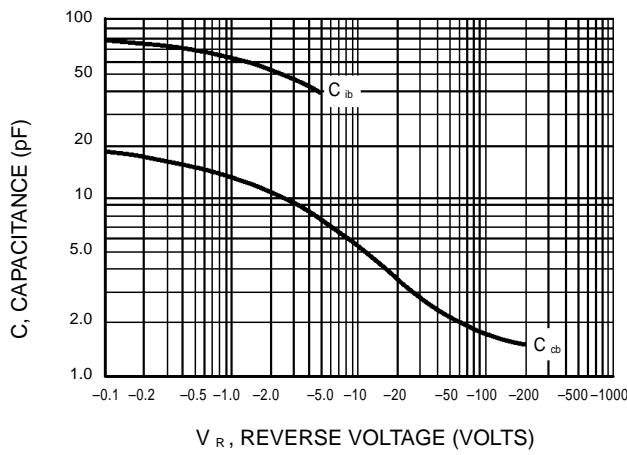


Figure 2. Capacitances

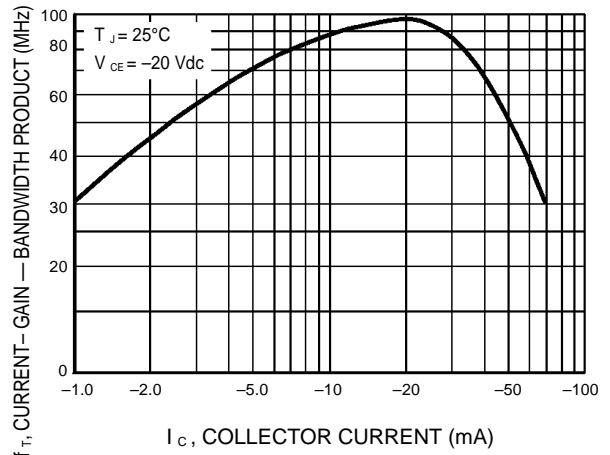


Figure 3. Current-Gain — Bandwidth Product

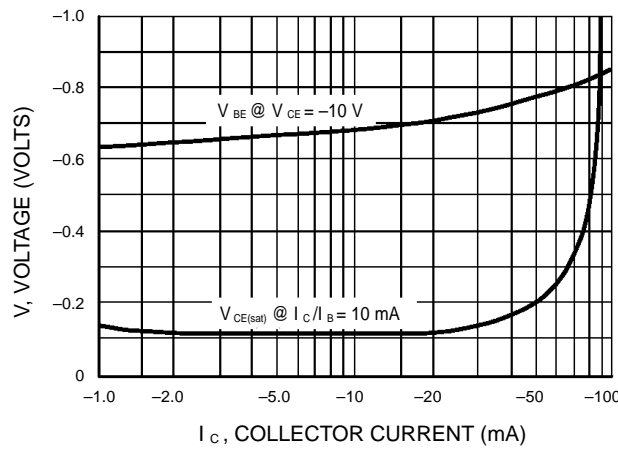


Figure 4. "On" Voltages